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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

ED 063416

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

EXTERMINATOR (any ind.) 389.884

S-232

TM 001 243

U. S. Employment Service in
Cooperation with
Florida State Employment Service

March 1963

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GATB # 2379

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

EXTERMINATOR (any ind.) 389.884-010

S-232

Summary

The General Aptitude Test Battery, B-1002A, was administered to a final sample of 55 men employed as Exterminator 389.884 by the Orkin Company, Miami and Tampa, Florida, and by the Nolan Company, West Palm Beach, Florida. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with criterion, job analysis data, and their combined selective efficiency, Aptitudes S-Spatial Aptitude, K-Motor Coordination, and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Exterminator (any ind.) 389.884 S-232

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
S	CB-1-F CB-1-H	90	S	Part 3	85
T	CB-1-G CB-1-K	70	K	Part 8	75
M	CB-1-M CB-1-N	95	M	Part 9 Part 10	90

Effectiveness of Norms

The data in Table IV indicate that 11 of the 18 poor workers, or 61 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 61 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 25 of the 32 workers who made qualifying test scores, or 78 percent, were good workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Exterminator (any ind.) 389.884.

II. Sample

The GATB B-1002A, was administered during the period April to August 1959 to a sample of 66 men employed as Exterminators 389.884 by the Orkin Exterminating Company in Ft. Lauderdale, Miami, and Tampa, Florida and by the Nolan Exterminating Company in West Palm Beach, Florida. The 66 workers comprised all of those available in Miami, Tampa, and West Palm Beach, or approximately 92%; however, the Ft. Lauderdale sample was less than half of the employed workers and it was not possible to obtain complete ratings on most of them, so the complete sample of 10 workers was dropped. One worker in the Tampa sample was also dropped because he had only a fourth grade education. The final sample consisted of 55 men.

No tests were used in the selection of workers for employment. The companies prefer individuals for employment who are between 35 and 55 years of age and have a high school education. All men must have a driver's license and be able to drive a light weight truck. The training time for this job is from two to three weeks and the ratings were not obtained until all the sample had been on the job long enough to be considered experienced workers.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 55	M	σ	Range	r
Age (years)	36.3	9.1	23-59	.266*
Education (years)	11.0	1.9	6-16	-.082
Experience (months)	22.9	44.0	1-240	.168

*Significant at the .05 level

The significant correlation in Table I indicates that either (1) older workers performed better on the job, or (2) raters were biased in giving higher ratings to these workers.

III. Job Description

Job Title: Exterminator (any ind.) 389.884-010

Job Summary: Kills by application of chemicals, vermin such as roaches, beetles, ants, silverfish, moths, and mice which infest buildings. Treats rooms, apartments, business establishments (food, retail, etc.) and entire buildings with one or several types of vermin-killing liquids or gases. Sprays chemical solutions or dusts powder throughout rooms and into hiding places to kill insects. Sets out poisonous paste or bait in boxes or other containers at or near places where vermin are present.

Checks to see that an adequate supply of chemicals is available on truck for service calls. Keeps record of chemicals withdrawn from storeroom. Operates truck over an established route. Attempts to collect for services rendered to lessen bookkeeping. Solicits new customers by explaining his service and its benefits. Completes daily report keeping record of stops, method and amount of payment, and expenses.

IV. Experimental Battery

All the tests of the GATB, B-1002A, were administered to the sample group.

V. Criterion

The criterion consisted of supervisory ratings made on Form SP-21, "Descriptive Rating Scale," developed by the United States Employment Service. The first ratings were collected in June 1959 and the second ratings were obtained in April 1960. Both ratings were made by the service supervisor of the branch to which the worker was assigned. The rating scale consisted of nine items with five alternatives for each item. The alternatives indicated the degree of job performance attained. Weights of one through five were assigned to each alternative so that the minimum possible score was nine and the maximum score was forty-five. The coefficient of reliability between the two ratings was .936 indicating a high reliability coefficient. The final criterion score consisted of the sum of the two total ratings for each individual. The distribution of final criterion scores ranged from 34-86, with a mean of 65.7 and a standard deviation of 13.0.

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis:

The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation.

Spatial Aptitude (S) - required to visualize building layout and structure in planning to treat remote areas of buildings.

Clerical Perception (Q) - required to keep accurate accounts and records of work and material used.

Motor Coordination (K) - required to coordinate movement of hands and eyes in use of equipment.

Finger Dexterity (F) - required to use measuring devices and small equipment.

Manual Dexterity (M) - required to handle equipment in carrying it from truck to place of application; and in manipulation in applying insecticides with spraying and fogging equipment.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 55

Aptitudes	M	σ	r
G-Intelligence	97.1	15.6	.089
V-Verbal Aptitude	96.5	16.8	.023
N-Numerical Aptitude	95.3	15.5	.055
S-Spatial Aptitude	97.8	19.6	.117
P-Form Perception	94.3	21.2	.134
Q-Clerical Perception	98.0	15.5	.136
K-Motor Coordination	98.2	18.3	.174
F-Finger Dexterity	96.3	20.5	.220
M-Manual Dexterity	110.7	22.9	.431 **

**Significant at the .01 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important				X		X	X	X	X
Irrelevant									
Relatively High Mean				X		X	X		X
Relatively Low Sigma									
Significant Correlation with Criterion									X
Aptitudes to be Considered for Trial Norms				S		Q	K		M

Trial norms consisting of various combinations of Aptitudes S, Q, K and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of S-85, K-75 and M-90 had the best selective efficiency.

VII. Validity of Norms

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 33 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes S, K and M with critical scores of 85, 75 and 90, respectively, and the dichotomized criterion for Exterminator 389.884. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Exterminator (any ind.) 389.884
(S-85, K-75, M-90)

N = 55	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	12	25	37
Poor Workers	11	7	18
Total	23	32	55

Phi Coefficient = .27
χ^2 = 4.098
P/2 < .025

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes S, K and M with minimum scores of 85, 75 and 90, respectively, have been established as B-1002 norms for Exterminator (any ind.) 389.884 The equivalent B-1001 norms consist of S-90, T-70 and M-95.

IX. Determination of Occupational Aptitude Pattern

The specific norms established for this study did not meet the requirements for allocation into any of the existing 35 OAP's (revised 10/61). The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.